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ABSTRACT

The linguistic development of 42 learning disabled students 10-16 years old was examined. Responses were elicited to five linguistic structures, including the distinction between "ask" and "tell", pronominal restriction, and the minimum distance principle. Data were analyzed in terms of three groups based on Verbal and Performance differentials on the Wechsler Intelligence Scale for Children, and in terms of the Ss' performance as a whole to determine whether the constructions were acquired in the order previously suggested by C. Chomsky. Results indicated that the Ss demonstrated late (approximately 3-4 years) and idiosyncratic acquisition of the structures, although most of them did acquire them in the order posited by Chomsky for normal younger children. (CL)

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Some Evidence of Continuing Linguistic Acquisition in learning disabled adolescents

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Paper presented at the International Federation of Learning Disabilities, 3rd International Scientific Conference, Montreal, Canada, 9th-13th August, 1976.

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INTRODUCTION:

Through the late 1960's, it was widely assumed by linguists, psychologists and educators that children's grammar was fully developed by the age of eight, or even much earlier. The eminent American linguist Martin Joos, writing in 1964 in an often reprinted article said, "...learning the grammatical system...is complete--and the books are closed on it!--at about eight years of age. It is not normal to learn any more grammar beyond that age...It appears that any who had not learned it by age eight were destined never to learn it, for after that it was too late." (Joos, 1964:205).

In 1968, Carol Chomsky's study of the acquisition of syntax in children aged 5 to 10, demonstrated that linguistic development continues through the pre-pubertal years. Chomsky (1968) examined the responses of 40 elementary school children to four syntactic structures which she considered to be candidates for late acquisition because they were exceptions or violations of easily and early learned general rules of English. The responses of the children in this study (and a follow-up in 1971) showed that grammatical development occurred at a variable rate across individuals, but in an apparently invariant developmental sequence, where A preceded B, and both A and B were implied in the use of C. That the process of normal language acquisition clearly extends well into adolescence has since been substantiated in the findings of Cromer (1970, 1974); Kramer, Koff and Luria (1972); Maratsos (1974); and Menyuk (1975, a,b) among others, and indeed post-childhood language acquisition has become the focus of attention among some psycholinguists, and social-psychologists

(see Sociolinguistics Conference, Indiana University, November 14-16, 1975; Grimshaw and Holden, 1976).

The relevance of adolescent language development for educational practices and attitudes is not insignificant; and continuing late language acquisition raises some interesting questions about linguistic development in children with special handicaps. For example, do children with so-called language-learning disabilities acquire grammatical structures in the same order as other children? Are there some structures that they do not acquire at all? If their linguistic development is delayed, as is so often assumed, is the lag a significant one in the light of the enormous variability found among 'normal' children? And is, indeed, the disorder syntactic? Is it cognitive? Is it both, or neither?

Over the past four years our own research has included experimental and theoretical investigations into aspects of later linguistic development in normal and language delayed children. Let us summarize it briefly. Our initial study replicated, with some modifications, Chomsky's 1968 and 1971 studies, with a sample of 42 adolescent learning disabled children. The results appeared to support our hypothesis that adolescents with language-learning disabilities would demonstrate delayed or idiosyncratic acquisition of linguistic structures. But we questioned the feasibility of drawing conclusions about learning disabled adolescents in the absence of comparable information about 'normal' adolescents.

An experimental pilot study was conducted with randomly selected public school 9th graders to elicit their judgements

and production of requests in complement sentences with ask and tell, promise, persuade, and threaten. The complications of power position, deference, and ambiguity were introduced. The findings suggest that adolescents make interesting errors revealing of their metalinguistic and operational development, rather than any linguistic deficiency, and that those errors are not different in kind from those made by teen agers with language-learning disorders.

A theoretical paper (Thomas, 1976) explores the effects on the linguistic judgements of teen agers of a "supernormal linguistic stimulus" that creates fuzzy sets, and appears to permit multiple interpretations. Corollaries in cognitive development are suggested.

Recently completed research (Walmsley, 1976) examines one aspect of this cognitive development, namely use and comprehension of logical connectives by adolescents.

Finally, an experimental study is currently being undertaken to compare normal and language-learning disordered adolescents in the areas of linguistic discourse and structure, and logical strategies (Walmsley and Thomas, in progress).

This paper reports in detail on the first of these investigations, and the implications for further research in learning disorders.

THE STUDY:

Selection of subjects

From a residential school for learning disabled children, 42 pre-pubertal and adolescent subjects were selected from the total population. Criteria for selection was the point span

between Verbal and Performance scores on the WISC (Weschler Intelligence Scale for Children):

Group 1 (N=16) exhibited more than 10 points in favor of Performance;

Group 2 (N=18) had less than a 10 point difference between Verbal and Performance scores, in favor of Performance;

Group 3 (N=8) demonstrated a difference in favor of Verbal (these 7 subjects were the only children then attending the school who had higher verbal than performance scores, and only one of them had a point difference greater than 8).

Subjects' ages ranged from 10.3 to 16.11 years (M-13.1; s.d. 1.8); Means and standard deviations of group characteristics (age, IQ-full scale, verbal and performance) are presented in Table 1.

----------INSERT TABLE 1 ABOUT HERE----------

METHOD:

The testing procedures were a modification of the Chomsky 1968 and 1971 studies. Responses were elicited to the following structures:

Structure	Presumed Complexity
(1) He found out that Joe had K. P. Duty.	Pronoun in the main clause preceding the noun phrase is restricted to non-identity; he cannot refer to Joe.
(2) Joe is easy to see.	Usual subject-verb-object word order is violated. Joe is the object, not the subject of the sentence.
(3) The man promises Joe to sit down.	The minimum distance principle is violated. Subject of sit is not the immediately preceding noun.
(4) The girl asks the boy what to paint.	Violation of the "M.D.P." as above.

TABLE 1

Means and standard deviations of subject characteristics (Age, IQ Full Scale, Verbal, Performance) displayed by group

Variable		N= 16 Group 1	N=18 Group 2	N= 8 Group 3	N=42 Total
Age	mean=	13.68	12.75	12.75	13.1
	s.d.=	1.99	1.68	1.37	1.78
IQ Fullscale	mean=	99.9	104.5	106.9	103.0
	s.d.=	8.9	13.09	13.7	11.7
Verbal	mean=	89.8	101.3	109.7	98.0
	s.d.=	7.9	11.8	12.6	12.7
Perf.	mean=	110.9	107.1	102.4	107.8
	s.d.=	10.0	12.2	13.6	11.7

(5) The man isn't STANDING on the table. standing ON the table. standing on the TABLE.	Contrastive stress changes the focus of negation without surface structure change.

Pictures and G. I. Joe dolls in distinctive costumes were used to enhance the children's understanding of the interview questions which sought to elicit the following judgements:

in (1)-who the pronoun referred to;

in (2)-whether or not a blindfolded doll was 'easy to see';

in (3)-who performs the act stipulated in a promise;

in (4)-what one actually says when asking or telling;

in (5)-how the meaning of a sentence can be changed by strong emphasis on different words.

Chomsky had found that by age of 5.6, all children demonstrated understanding of pronominal restriction. Mastery of the easy to see structure occurs between 7.0 and 9.0 years and precedes full knowledge of the promise construction. All children over the age of 9.0 appear to use promise with full understanding. But the ask/tell distinctions are late developing and may never be fully resolved by some individuals (Kramer, Koff, and Luria, 1972). Since knowledge of a 'lower' construction seems to be implied in the 'higher' ones, the progressive levels of competence are discussed in terms of stages.

To elicit this information from our teen age subjects, a psychometric approach was eschewed in favor of a clinical, psycholinguistic inquiry method that probed conversationally until satisfied as to the extent of each subject's competence with every test sentence. On this basis we required unequivocal responses to all test constructions for a designation of full competence.

RESULTS:

The data were analyzed in two ways. Performances of subjects by groups (as defined on p. 4) were examined to determine if the original criteria for selecting groups were justified. Next, the performances of the subjects as a whole were analyzed to see if the constructions were acquired in the same order as previously suggested by Chomsky (1968, 1971) and others.

Group performance

The performances of the three groups on the various linguistic tasks are presented in Table 2.

----------INSERT TABLE 2 ABOUT HERE----------

It may be seen from Table 2 that the three groups do perform differently on each of the constructions tested, and that their average "stage" score improves with group placement (2.7 in Group 1; 3.2 in Group 2; 4.9 in Group 3). However, since the group Ns are unequal, and in particular Group 3's size is so small, these data may only be regarded as suggesting a trend, namely that the original criteria for selection of the groups--i.e. point spread between Verbal and Performance--is a meaningful factor in determining the performance of a leaning disabled youngster on the linguistic constructions tested.

A correlation matrix (see Table 3) reveals that in fact

----------INSERT TABLE 3 ABOUT HERE----------

for this sample verbal intelligence (as measured by the WISC) is more highly correlated with success in the study's tasks than is the performance scale, the full-scale IQ, or age. If anything, age is negatively correlated with performance--i.e. the older one is, the worse one performs. However, this is

TABLE 2

Performance on linguistic constructions by subjects, presented by group

Construction	Group 1 N=16	Group 2 N=18	Group 3 N=8	Combined N=42
Easy to See	% correct 70.6	77.8	100.0	78.6
Promise	35.3	61.1	100.0	57.1
Picture/Ask	41.1	77.8	85.7	64.3
Pronominalization	82.4	77.8	100.0	83.3
Contrastive Stress	17.6	27.8	28.6	23.8
Total Score (unweighted total of constructions)	2.5	3.2	4.1	3.1
Stage Placement (weighted total of constructions; see Table 4)	2.7	3.2	4.9	3.3

TABLE 3

Pearson R Correlation matrix showing relations between subject characteristics (age, IQ) and performance on linguistic constructions

	AGE	IQ FULL	VERB	PERF	GROUP	ETS	PROM	PICTASK	PRONOM	C-STRESS	STAGE	TOT SCORE
AGE	1.00											
IQ FULL	-.27	1.00										
VERB	-.27	.90***	1.00									
PERF	-.19	.85***	.55***	1.00								
GROUP	-.28	.23	.58***	-.26*	1.00							
ETS	.32	.13	.22	-.01	.23	1.00						
PROM	-.28	.38	.51***	.13	.45***	.37*	1.00					
PICTASK	-.28	.45***	.54***	.21	.38*	.34	.56***	1.00				
PRONOM	.27	.07	.16	-.06	.12	.08	.26	.07	1.00			
C-STRESS	.13	.32	.32	.25	.11	.29	.26	.42*	.10	1.00		
STAGE	.16	.30	.45***	.04	.44*	.73***	.65***	.49***	.29	.43**	1.00	
TOTAL SCORE	.01	.43**	.56***	.17	.41*	.63***	.78***	.76***	.42*	.63***	.80***	1.00

more likely explained by the fact that in this study, the oldest subjects had generally lower measured IQ's than the younger ones. While these results are to be expected--after all, the linguistic constructions tested are strictly verbal tasks, the results appear to show that (1) for this sample, age makes little difference in test success; (2) performance scale (on the WISC) makes little difference; and (3) an overall high full-scale IQ that does not contain a high verbal scale score does not appear to make much difference.

DETERMINING STAGES:

The data were also analyzed in order to determine each subject's stage of development with regard to the linguistic constructions tested. Criteria for the arbitrarily designated stages was demonstrated competence.

Stage 1. failure to demonstrate competence with any construction, except pronominalization.

Stage 2. competence with easy to see, but no others.

Stage 3. competence with easy to see and promise.

Stage 4. competence with all structures (excepting contrastive stress).

The results are displayed in Table 4.

----------INSERT TABLE 4 ABOUT HERE----------

The results appear to indicate that the majority of learning disabled youngsters in our study were still in the process of progressing through the sequence of designated linguistic stages in the same order as had the 'normal' younger children. But the learning disabled children lag three to four years in acquiring the constructions tested. Success with easy to see

TABLE 4

Performances of subjects on five linguistic constructions, displayed by "stage"

Stage	Age	Easy to See	Promise	Pict/Ask	Pronom	C-Stress
STAGE 1	10.4	-	-	(+)	-	-
	11.4	-	-	-	-	-
	13.5	-	-	-	+	-
n=7	13.0	-	-	-	+	-
	14.2	-	-	-	+	-
	15.2	-	-	-	+	-
	11.0	-	-	(+)	+	-
STAGE 2	12.1	+	-	-	+	-
	12.2	+	-	-	+	-
n=5	14.6	+	-	-	+	-
	15.5	+	-	-	+	-
	16.4	+	-	-	+	-
STAGE 3	11.1	+	+	-	+	-
	12.1	+	+	-	+	-
	13.4	+	+	-	+	+
n=5	15.4	+	+	-	+	-
	16.4	+	+	-	+	-
STAGE 4	11.6	+	+	+	+	-
	11.8	+	+	+	+	-
	11.11	+	+	+	+	-
	12.3	+	+	+	+	-
	12.7	+	+	+	+	-
n=9	13.1	+	+	+	+	-
	13.2	+	+	+	+	-
	13.5	+	+	+	+	-
	14.9	+	+	+	+	-
	11.3	+	+	+	+	+
	13.3	+	+	+	+	+
	13.4	+	+	+	+	+
n=6	14.2	+	+	+	+	+
	14.10	+	+	+	+	+
	14.11	+	+	+	+	+
NON DEVELOPMENTAL GROUP	10.3	-	+	(+)	+	-
	10.8	-	+	(+)	+	-
	11.10	+	-	(+)	+	-
	12.2	+	-	(+)	+	+
	12.9	+	-	(+)	-	-
	14.7	+	-	(+)	-	+
n=10	16.1	+	-	(+)	+	-
	16.11	+	-	(+)	+	-
	11.1	+	(+)	(+)	-	-
	12.0	+	(+)	+	-	-

- = failure + = success (+) = questionable success

was not present in all subjects until after age 11.6; promise. after 13.1; the picture-ask task was failed by children as old as 12.3; contrastive stress was found in only 7 subjects; and there were 6 children who failed pronominalization. It even appeared that some of the subjects might have reached an arrested stage of linguistic development: none of the oldest subjects, aged 15.2 to 16.11, understood contrastive stress or were in the highest stage 4.

In addition to the developmentally delayed children there were, moreover, 10 subjects (36%) who did not fit into the developmental sequence at all, whose responses and competence were aberrant and idiosyncratic, and who may have learning disorders of a very different nature from the others.

Testing the hierarchical nature of stages

To determine whether a subject had to have 'passed' one stage before proceeding to the next, a statistical procedure called ordering theory (Bart & Kruss, 1973) was performed on the data. Essentially, this technique examines the logical relations between items, to determine whether a subject has to pass one item (or set of items) before passing others. In this study, if the constructions were perfectly hierarchical, then a subject who failed construction 2 must have failed constructions 3 and 4; similarly, a subject who passed construction 5 must have passed constructions 1-4. When analyzed by ordering theory, with a tolerance of 1%, only the following hierarchies are found:

Summary of implication relations in the form P is a Prerequisite to Q1, Q2, etc., using tolerance of 1.00%

P	Q1, Q2, etc.
Easy to See	Contrastive Stress
Promise	Contrastive Stress

No other constructions were found to be prerequisites to any other.

DISCUSSION:

The long continuum of normal language acquisition and development extending well into adolescence raises serious questions for the field of special education in learning disorders. In answer to the first question raised as to whether children with language-learning disabilities acquire linguistic structures in the same order as other children, there appear to be at least two different groups; those with delayed or attenuated development who seem to follow normal patterns, and those with abberrant language development. Children of the latter type are not a homogeneous group (Menyuk, 1975) but there is no strong evidence that the "language delayed" children are all of a type either.

Second, it appears very likely that there are linguistic structures or competencies that certain individuals do not develop. When these are only late developing perfectives (e.g. had been gone), or when complements with deleted subjects (e.g. ask Mary what to do), normal speakers can function quite efficiently without them. But when early, and elementary, and hierarchically critical linguistic forms are "missed", should ever widening complications in communication necessarily be predicted? There is very little hard evidence to support that assumption.

Third, since the range and variability of normal development is so great, can one evaluate learning disabled teenagers without comparable data on normal adolescents? The significance of a lag remains conjectural.

This brings us to the question of the nature of language disorders among those children who failed to demonstrate competence with the structures we presented them. The complexity of the constructions is not exclusively syntactic. Semantic relations must be used by the speaker-hearer in making grammatical judgments. Further, the analysis of an utterance outside the context of discourse is always an artificial task--a metalinguistic task. This ability to think about language and talk about it is itself an advanced linguistic form and there are wide individual differences in metalinguistic ability. Children with learning disorders appear to have particular problems with all such tasks, from stating the simplest perceptual discriminations to the linguistic judgement tasks we gave them.

It is possible that the source of difficulty here for learning disabled adolescents may lie in their lack of experience, and lack of interest in these metalinguistic tasks, as well as in their lack of ability. It is also possible that what gives these subjects such difficulty are the underlying cognitive complexities of the relations expressed by the constructions--in other words, the logical operations that a person has to perform in order to arrive at a satisfactory response to the task. Our present research is currently exploring these avenues.

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